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Chief, DAPD-DOS, Hq DA, OACSFOR; June 15, 1989.

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SELECTIVE AERIAL SPRAY SYSTEM

Army Concept Team in Vietnam
APO San Francisco 96384

21 June 1966

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ARMY CONCEPT TEAM IN VIETNAM
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ACTIV-10

JUN 21 1966

SUBJECT: Letter Report for Evaluation--Selective Aerial Spray System

TO: See Distribution

SEP 21 1973

TR - TNG (NBC)

AD 766673

1. (U) REFERENCES

- a. Letter, Hq, 173d Airborne Brigade (Sep), AIC 96250, same subject, dated 3 February 1966.
- b. Letter, Hq, United States Army, Vietnam, AFO 96307, same subject, dated 1 March 1966.

2. (U) AUTHORITY

1st Indorsement to reference 1b, Hq, JMATI, AFO 96309, same subject, dated 8 March 1966.

3. (U) PURPOSE

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The purpose of this evaluation was to determine the feasibility and desirability of the Selective Aerial Spray System (SASS) as a device for delivering defoliating agents and target-marking dyes on selected point locations.

4. (U) BACKGROUND

a. The 173d Airborne Brigade (Sep) recognized the need for an aerial defoliation system to mark and expose former VC point locations and routes of travel so that periodic interdiction missions could deny reuse of the areas. In addition, there was a need for an aerial spray system to defoliate small VC garden plots, fields of fire, and helicopter landing sites. These areas were considered too small to justify the use of larger aerial defoliation systems currently employed by the USAF.

b. The chemical officer and other personnel of the 173d Airborne Brigade designed and fabricated the SASS using parts available in the normal supply channels and components of a Service Kit, Portable Flame Thrower - Rich Contro. Agent Dispenser M-27 authorized by TOE.

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c. The delivery system was mounted in a UH-1H helicopter, tested on small areas of dense forest, and found to be simple, flexible, and effective.

5. (U) DESCRIPTION OF MATERIEL

See inclosure 1.

6. (C) DISCUSSION

a. A letter of inquiry was dispatched to DA, OGD, Washington, D.C., requesting information on the availability of systems such as the SASS. In reply OGD stated:

(1) There are many agricultural spray systems for commercial use in helicopters and one such system, developed by Agavenco, was presently undergoing operational tests in Vietnam. Six of these units were deployed in February 1966; four to the 20th Preventive Medicine Unit in Saigon and two to the 376th Medical Detachment, 1st Logistic Command at Qui Nhon.

(2) The Agavenco units are made specifically for use with UH-1B or D helicopters. They have a 200-gallon capacity and spray three gallons of defoliant per acre.

(3) Edgewood Arsenal is presently investigating systems which could be used to spray nonlethal agents.

(4) There is no objection to the further use of SASS on an interim basis until a system requirement is proposed in the form of a QMR or SDR. There is presently no QMR or SDR in being for a defoliation system to be used with Army aircraft.

b. The project officer viewed the SASS and the results of the spray tests in the vicinity of Bien Hoa. He found that the spray system was simply constructed using hardware and hoses available in the brigade and air pressure components of the Service Kit, Portable Flame Thrower - Riot Control Agent Dispenser M-27. The entire system weighs approximately 650 pounds which includes 55 gallons of defoliant. The delivery system can easily be installed in UH-1B or D helicopters without modification to the aircraft. (See inclosure 1). The 55 gallon drum is strapped to the floor and the spray pipe tied to the rear skid strut.

c. Several tests were conducted using Butyl Esters Mixture, 50% 2, 4-D and 50% 2, 4, 5-T defoliant. The consistency of the mixture was varied using JP-4 fuel as a solvent. Quantities of one-third, two-thirds and full Butyl Esters Mixture were sprayed on swatches of dense forest covering areas approximately 200 meters in diameter and on 50-meter-wide strips along stream beds 600 to 1000 meters in length. The defoliant was dispensed from 30 to 50 feet above the trees at the rate of approximately

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gallons per acre. It was found that the spray area fans out at altitude in use, reducing the effectiveness of the defoliation and results were obtained during little or no surface wind conditions. The one-third mixture caused the foliage to turn yellow after 15 days and noticeably brown after 30 days. The two-thirds mixture area turned noticeably brown after 7 days. The full mixture produced a readily noticeable brown effect after only 3 days. The sprayed areas prominently stand out when observed from varying approach directions and altitudes. Since the effect lasts for one growth year, subsequent spraying is not required for several months.

d. This system has the capability of defoliating fields of fire and helicopter landing sites. It also has the capability of spraying herbicides on small garden plots to eliminate a source of food supply for the VC.

e. The project officer visited the 20th Preventive Medicine Unit, APO 96307, to view the Agavenco Aerial Spray System. Major Larry Johnson tested the equipment using insecticide only. The spray system produced 100 percent effectiveness when applied to mosquito larvae. Best results were obtained during early morning calm periods. The spray system incorporates a direct-coupled, variable-pitch, air-driven windmill to supply the needed pressure to spray the liquid, nozzles to atomize the spray, and two spray booms 12 feet in length which provide coverage of a swath 200 feet wide. The equipment is self contained and requires no modification of either the B or D model of the UH-1 helicopter. The spray system weighs 200 pounds and has a liquid capacity of 196 gallons. Major Johnson stated that the system could not be used interchangeably from herbicide to insecticide because the herbicide could not be readily purged out of the system. The Agavenco Aerial Spray System provides a greater capacity and more effective means of delivery than the selective aerial spray system; however, its size would restrict the UH-1B helicopter from carrying door gunners who are considered necessary for the security of the low flying aircraft.

7. (U) CONCLUSIONS

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It is concluded that:

a. A requirement exists for an Army aircraft defoliation system, however, there is presently no QMR or SDR in being.

b. The SACM as fabricated by the 173d Airborne Brigade (Sep) is feasible and desirable as an interim means of defoliating and marking small VC locations and trails.

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c. The system has the additional capability of defoliating small garden plots, fields of fire, and helicopter landing sites.

d. All ground combat units of battalion size having the Service Kit Portable Flame Thrower - Riot Control Agent Dispenser M-27 as authorized equipment have the capability of fabricating this spray system.

8. (U) RECOMMENDATIONS

It is recommended that:

a. A suitable aerial spray system be developed for use with HH-1B and D helicopters to provide for small area defoliation.

b. The SASS be authorized for use with HH-1B and D helicopters on an interim basis.

c. The installation instructions and parts list attached be distributed to all units in the command.

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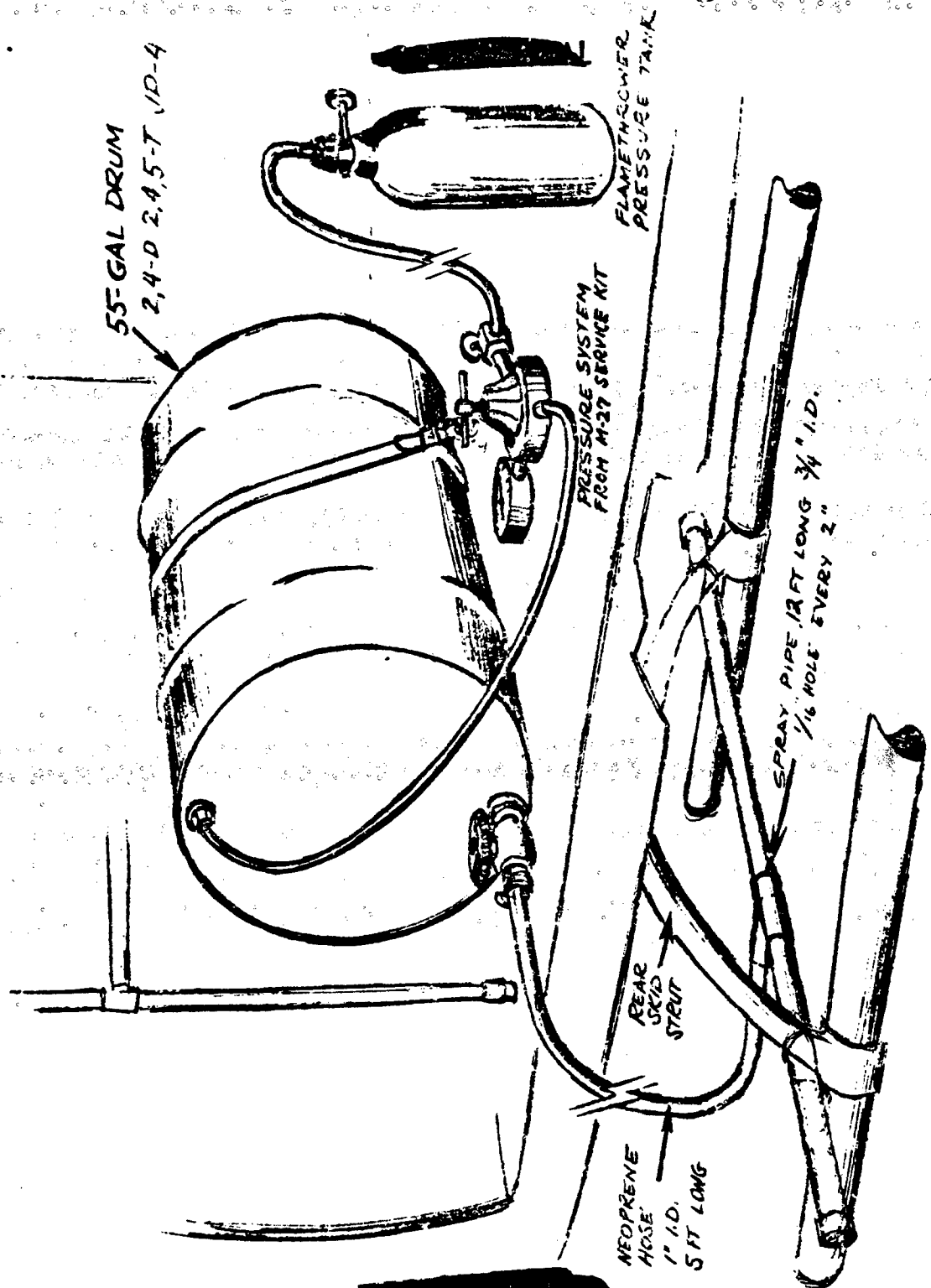
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1st Brigade, 101st Airborne Division	10

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SASS PARTS AND COMPONENTS

PARTS

- 1 - 3/4 gate valve with two (2) 3/4" x 3" nipple
- 1 - Bushing, 2 1/2" to 3/4" (Svc Kit M27)
- 1 - Rubber hose assembly (Svc Kit M27)
- 1 - Rubber hose assembly, 6 feet (Svc Kit M27)
- 1 - Plastic hose 3/4" x 5 feet
- 1 - Pipe, 3/4" X 12 feet, threaded on each end, with 1/6" hole every 2"
- 1 - End cap for 3/4" pipe
- 2 - Hose clamps, 3/4"

COMPONENTS

- 1 - 55 gallon drum, 16 gauge, with standard 3/4" and 2 1/2" bungs
- 1 - Portable Flame Thrower pressure bottle
- 1 - Pressure regulator (Svc Kit M27)

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SASS MOUNTING AND OPERATING INSTRUCTIONS

1. Mount the 55 gallon drum on its side in the helicopter utilizing tie down straps. The gate valve may face to either the right or left side.
2. Mount the twelve foot spray pipe across the rear skid supports of the helicopter utilizing nylon tie downs on one end and a hose clamp assembly on the other.
3. Attach the 5 foot plastic hose to the 3/4" x 3" nipple extending from the gate valve and then to the 3/4" nipple extending from the elbow on the 12 foot spray pipe.
4. Attach the pressure line to the 3/4" bung on the 55 gallon drum.
5. Pressurize the drum to 5 psi when the helicopter is airborne.
6. Open the gate valve to release spray as desired.

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